

2 assertion information appended to the public key of the first key pair, said
3 assertion information including a pointer which uniquely identifies the public key
4 of the second key pair.

1 6. A system according to Claim 5, wherein said assertion information
2 includes constraints specifying use of the public key of the first key pair.

1 7. A system according to Claim 6, wherein the constraints include a
2 constraint specifying that use of the public key of the second key pair is
3 mandatory during encryption of a message using the public key of the first key
4 pair.

1 8. A system according to Claim 1, wherein at least one key pair
2 comprises a Diffie-Hellman-compatible key pair.

1 9. A system according to Claim 1, wherein at least one key pair
2 comprises an RSA-compatible key pair.

1 10. A system according to Claim 1, wherein said message being
2 encrypted comprises a selected one of a text file and a binary file.

1 11. In a computer system providing public key cryptography, a method
2 for assisting with recovery of messages sent to users, the method comprising:

3 generating a first key pair for a particular user, the first key pair
4 comprising a public key employed for encrypting messages sent to the particular
5 user and comprising a private key employed for decrypting messages which have
6 been encrypted using the public key of the first key pair;

7 generating a second key pair for message recovery, the second key pair
8 comprising a public key employed for recovering messages which have been
9 encrypted using the public key of the first key pair and comprising a private key
10 employed for decrypting messages which have been encrypted using the public
11 key of the second key pair;

12 embedding within the public key of the first key pair information
13 referencing the public key of the second key pair; and

1 19. A method according to Claim 11, wherein at least one key pair
2 comprises an RSA-compatible key pair.

1 20. A method according to Claim 11, wherein said message being
2 encrypted comprises a selected one of a text file and a binary file.

1 21. A computer-readable storage medium holding code for performing
2 the method according to Claims 11, 12, 14 and 15.

1 22. A public key encryption system integrating a message recovery
2 key, comprising:

3 a session encryption module block-cipher encrypting a plaintext message
4 into cyphertext using a session key;

5 a public key encryption module encrypting the session key using a public
6 key of a user, the public key of the user being associated with a private key
7 generated simultaneously thereto and encrypting the session key using a public
8 key of a message recovery agent automatically triggered upon use of the public
9 key of the user, the public key of the message recovery agent being associated
10 with a private key generated simultaneously thereto; and

11 a digital envelope forming an encrypted message comprising the
12 cyphertext and the encrypted session key.

1 23. A system according to Claim 22, further comprising:

2 a public key decryption module decrypting the encrypted message by the
3 user, by decrypting the encrypted session key using the private key of the user and
4 block-cipher decrypting the cyphertext using the decrypted session key.

1 24. A system according to Claim 22, further comprising:

2 a public key decryption module decrypting the encrypted message by the
3 message recovery agent, by decrypting the encrypted session key using the private
4 key of the message recovery agent and block-cipher decrypting the cyphertext
5 using the decrypted session key.

1 25. A system according to Claim 22, further comprising:
2 a reference stored into the public key of the user to automatically use the
3 public key of the message recovery agent upon use of the public key of the user.

1 26. A system according to Claim 25, further comprising:
2 the public key of the message recovery agent embedded as the reference
3 into the public key of the user.

1 27. A system according to Claim 25, further comprising:
2 a pointer to the public key of the message recovery agent embedded as the
3 reference into the public key of the user.

1 28. A system according to Claim 27, further comprising:
2 at least one of a cryptographic hash and a message digest of the pointer
3 stored as the reference to the public key of the message recovery agent.

1 29. A system according to Claim 25, further comprising:
2 a digital signature formed from the private key of the user; and
3 the reference stored into the public key of the user upon successfully
4 authenticating the digital signature.

1 30. A method for integrating a message recovery key into a public key
2 encryption system, comprising:
3 block-cipher encrypting a plaintext message into cyphertext using a
4 session key;
5 encrypting the session key using a public key of a user, the public key of
6 the user being associated with a private key generated simultaneously thereto;
7 encrypting the session key using a public key of a message recovery agent
8 automatically triggered upon use of the public key of the user, the public key of
9 the message recovery agent being associated with a private key generated
10 simultaneously thereto; and
11 forming an encrypted message comprising the cyphertext and the
12 encrypted session key.

1 31. A method according to Claim 30, further comprising:
2 decrypting the encrypted message by the user, comprising:
3 decrypting the encrypted session key using the private key of the
4 user; and
5 block-cipher decrypting the cyphertext using the decrypted session
6 key.

1 32. A method according to Claim 30, further comprising:
2 decrypting the encrypted message by the message recovery agent,
3 comprising:
4 decrypting the encrypted session key using the private key of the
5 message recovery agent; and
6 block-cipher decrypting the cyphertext using the decrypted session
7 key.

1 33. A method according to Claim 30, further comprising:
2 providing a reference into the public key of the user to automatically use
3 the public key of the message recovery agent upon use of the public key of the
4 user.

1 34. A method according to Claim 33, further comprising:
2 embedding the public key of the message recovery agent as the reference
3 into the public key of the user.

1 35. A method according to Claim 33, further comprising:
2 embedding a pointer to the public key of the message recovery agent as
3 the reference into the public key of the user.

1 36. A method according to Claim 35, further comprising:
2 storing the reference as at least one of a cryptographic hash and a message
3 digest of the pointer to the public key of the message recovery agent.

1 37. A method according to Claim 33, further comprising:

12 key of the user, the public key of the message recovery agent being associated
13 with a private key generated simultaneously thereto;
14 decrypting the encrypted session key using the private key of the message
15 recovery agent; and
16 block-cipher decrypting the cyphertext into plaintext using the decrypted
17 session key.

1 42. A method according to Claim 41, further comprising:
2 authenticating a digital signature generated from the private key of the
3 user; and
4 storing the association to the public key of the message recovery agent
5 into the public key of the user.

1 43. A computer-readable storage medium holding code for performing
2 the method according to Claims 41 and 42.

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